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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,143	08/20/2003	Vikram Magoon	P16184	7155

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GROSSMAN, TUCKER, PERREAULT & PFLEGER, PLLC
C/O PORTFOLIO IP
P. O. BOX 52050
MINNEAPOLIS, MN 55402

EXAMINER	
VAN ROY, TOD THOMAS	

ART UNIT	PAPER NUMBER
2828	

DATE MAILED: 11/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/645,143	MAGOON, VIKRAM	
	Examiner	Art Unit	
	Tod T. Van Roy	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 09/06/2006 have been fully considered but they are not persuasive.

With respect to claims 1-17, and namely the combination of the Kobayashi, Bosch, and Inoue references, the applicant has stated that neither individually or in combination do the cited references teach "a duty cycle control circuit, including an average power approximation circuit, to control the duty cycle of the pulse data output signal based, at least in part, on an approximation of an average power of the pulse data output signal." The examiner does not agree with the applicant's arguments.

As to the relevance of the Kobayashi reference the examiner refers the applicant to the Response to Arguments found in a previous office action (paper no.11212005). The examiner further notes a duty cycle control circuit is used in Kobayashi (and acknowledged in the applicant's Arguments at lines 1-2 of page 7) to control the duty cycle of the pulse data output signal.

Bosch is combined with Kobayashi not for teaching duty cycle control, but rather to teach feedback from an output based in part on the output power. This feedback is delivered to a duty cycle input circuit (duty cycle of input data) and in one embodiment the feedback is based on duty cycle levels. For this reason the examiner believes that one of ordinary skill in the art at the time of the invention would find the combination of Kobayashi's duty cycle control of the input circuits with the feedback, based in part on

the output power, to the input circuit of Inoue (taught to be used with duty cycle applications) to actively adjust the input levels based on the values seen at the output.

Inoue is next combined with Kobayashi and Bosch. This reference is not relied upon to teach duty cycle control, but to teach the benefits of using averaged values when using feedback in a driving circuit. This feedback is based on the output power of the system, the values averaged, and then sent to the laser controlling circuit. For this reason the examiner believes that one of ordinary skill in the art at the time of the invention would find the combination of Kobayashi and Bosch's duty cycle controlling circuit with output feedback with the output feedback based on averaged values of Inoue in order to obtain more comprehensive feedback to the input controlling circuit.

In summary, the examiner acknowledges that Kobayashi, Bosch, and Inoue do not individually teach "a duty cycle control circuit, including an average power approximation circuit, to control the duty cycle of the pulse data output signal based, at least in part, on an approximation of an average power of the pulse data output signal." Kobayashi teaches the control of the duty cycle by controlling input circuits, Bosch teaches incorporation of feedback of the output power to controlling input circuits (including demonstrating this when using duty cycle controlling values), and Inoue teaches the use of averaged values in feedback circuits from output power monitors. The combination of these three elements is believed to correctly teach the claimed limitations in the instant invention.

Double Patenting

As discussed in the applicant's Remarks, pg.11, the provisional obviousness type double patenting rejection is stayed pending the outcome of the co-pending application No. 10/422829.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi (US 6373346) in view of Bosch et al. (US 6130562) and further in view of Inoue et al. (US 6975813).

With respect to claims 1 and 7, Kobayashi teaches a laser driver circuit comprising an input stage (fig.6 #102,104) to receive an input signal (fig.6 IN+,IN-), a limiting amplifier (fig.6 #Q3, Q4 and #Q23, Q24 forming amps) to generate a pulse data output signal (figs. 3a-3b) comprising a duty cycle (seen in figs. 3a-3b), an output stage

to modulate an output current signal based upon the pulse data output signal (fig.6 #108, col.5 lines 28-30), and a duty cycle control circuit (fig.6 #150) to control the duty cycle of the pulse data output signal. Kobayashi does not teach the duty cycle to be based on an average power of the pulse data output signal, or to include an average power approximation circuit. Bosch teaches a laser driving circuit with an output feedback circuit to a duty cycle input circuit (fig.3 #212) based on a power of the output (fig.3 #124, from #148 to VC2). Inoue teaches a laser driving circuit wherein an average power approximation circuit is used, and coupled to a feedback loop (fig.4 #20, resistor/capacitor). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser driver of Kobayashi with the feedback circuit based, in part, on the output power, of Bosch in order to actively adjust the input levels based on the values seen at the output, as well as to couple the feedback loop with the average power approximation circuit of Inoue in order to use an averaged value of the output power, rather than a single, instantaneous value to obtain more comprehensive feedback to the input controlling circuit.

With respect to claim 2, Kobayashi, Bosch and Inoue teach the laser driver as outlined in the rejection to claim 1, and further teach the input signal to comprise a bi-level signal (Kobayashi, fig.6 IN+, IN-; col.3 lines 47-48).

With respect to claims 3 and 8, Kobayashi, Bosch and Inoue teach the laser driver as outlined in the rejection to claim 1, and further teach the input stage to generate a differential signal on first and second terminals (fig.6 OUT+,OUT-) coupled to the limiting amplifier (fig.6, OUT+/- coupled to both limiting amps made up of #Q3/4

and #Q23/24), and wherein the duty cycle circuit comprises a current steering circuit to apply an offset current to al least one of the first and second terminals (col.6-7 lines 63-2) in response to the approximation of the average power of the pulse data output signal.

Claims 4-6 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi, Bosch and Inoue and further in view of Gilliland et al. (US 6711189).

With respect to claims 4 and 9, Kobayashi, Bosch and Inoue teach the laser driver as outlined in the rejection to claim 1, and further teach a resistor pair, Rdcd1 and Rdcd2, located in the duty control circuit to be used to set the VDCD control voltage which effects the duty cycle of the pulse data output signal (Kobayashi, col.7 lines 2-11). Kobayashi and Larson do not teach the use of a potentiometer. Gilliland teaches a laser power control circuit in which a potentiometer is used to control an output voltage (abs. lines 4-5). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser driver duty control circuit with the potentiometer of Gilliland in order to allow for adjustability of the resistance values and hence the controlling voltage.

With respect to claims 5-6 and 10-11, Kobayashi, Bosch and Inoue, and Gilliland teach the laser driver as outlined in the rejection to claims 4 and 9 above, and further teach the duty control circuit to comprise a differential amplifier (Kobayashi, fig.6 formed from QDCD1 and QDCD2) to generate a differential voltage on first and second terminals (Kobayashi, col.7 lines 13-35, terminals leading to Q4 and Q24) in response

to the pulse data output signal, and wherein the potentiometer (Kobayashi's Rdcd1 and Rdcd2 having been replaced by Gilliland's potentiometer) is coupled to the differential amplifier to determine a resistance between a voltage source (Kobayashi, fig.6 VDCD) and each of the first and second terminals (Kobayashi, col.7 lines 2-35, speaking of how the resistance changes the VDCD offset level applied through the two terminals to affect the output pulse data).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi, Bosch and Inoue and further in view of Kenny (US 6654565).

With respect to claim 12, Kobayashi, Bosch and Inoue teach the laser driver outlined in the rejection to claim 1, and further teach the driver to be used with a laser device (Kobayashi, col.1 lines 37-50). Kobayashi, Bosch and Inoue do not teach the laser driver to use a serializer. Kenny teaches a communication system utilizing a serializer (fig.9 #930). It would have been obvious at the time of the invention to combine the laser driver of Kobayashi, Bosch and Inoue with the serializer of Kenny in order to implement the laser and driver into a high-speed system (Kenny, col.19 lines 56-60).

Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi, Bosch and Inoue and Kenny, and further in view of Diaz et al. (US 6822987).

With respect to claim 13, Kobayashi, Bosch and Inoue, and Kenny teach the laser driving system as outlined in the rejection to claim 12, but do not teach the use of a SONET framer. Diaz teaches a high-speed laser array which uses a SONET framer (col.10 lines 46-48). It would have been obvious to one or ordinary skill in the art at the time of the invention to combine the laser driver system of Kobayashi, Bosch and Inoue and Kenny with the SONET framer of Diaz in order to provide for high bit rate during very high speed applications (Diaz, col.9 lines 50-57).

With respect to claims 14-17, Kobayashi, Bosch and Inoue, Kenny, and Diaz teach the laser system as outlined in the rejections to claims 12, and 13, while it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser system with a switch fabric coupled to the SONET, an Ethernet MAC and a multiplexed data bus since these components are well known and widely used in communications systems.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TVR

MINSUN OH HARVEY
PRIMARY EXAMINER